Case Study

Ozonia — for innovative solutions

Loftsome Bridge

Yorkshire Water Services Ozone Plant
In 1994 Yorkshire Water Services and Ozonia installed ozonation facilities at the Loftsome Bridge Water Treatment Works in East Yorkshire. This plant treats water drawn from the River Derwent into a bankside storage reservoir. It has been installed primarily for pesticide removal and algae control to enhance the slow sand filters without the need for expensive GAC.

Ozonia undertook to design, manufacture, supply and install the ozone plant and all of the associated mechanical, electrical and instrumentation equipment to provide a fully operational plant.

In order to double the maximum throughput the water works at Loftsome Bridge has undergone a major enhancement, of which the ozonation process forms a significant part.

Ozone is dosed before the rapid gravity filters primarily for pesticide removal. This preozonation is also used to enhance diatom removal and improve turbidity removal. Due to the challenging quality of the water Ozonia's patented radial diffusers are used which, unlike porous diffusers, will not clog.

The plant consists of two ozone generators each rated at 9.5 kg/h of ozone at 6wt% concentration in oxygen, which operate as duty/standby.

The plant is fully automatic with a supervisory Programmable Logic Controller (PLC) as the central control and local "distributed" control at each of the main pieces of equipment. The main PLC controls the sequenced operation of all the plant items, while local logic systems supervise the operation of these items.

Each ozone generator has its own Power Supply Unit (PSU) which is a three phase six pulse system feeding a single phase output through a 10 kV transformer at a frequency of 700 Hz. The ozone is dosed as a function of process water flow.

The duty/standby Vent Ozone Destruction system (VOD) is of the thermal type with a heat recovery system to economise on electrical power. The destructors reduce ozone emission levels to well below the required limits. The spent gases are vented to atmosphere.

Since startup the plant has performed excellently. More details can be found in the paper "Uprating Barmby WTW" by D. Wilson in ‘Advances in Slow Sand and Alternative Biological Filtration’ (Graham N. & Collins R., Ed.), John Wiley & Sons, Chichester, 1996, pp 438-448.
Loftsome Bridge WTW

Water Source: Reservoir fed from the River Derwent

Treatment Process: Ferric sulphate dosing
- Preozonation
- Rapid gravity filters
- Covered slow sand filters
- Disinfection (Chlorine)
- Distribution

Ozone Use
- Preozonation: Pesticide removal and enhancement of the rapid gravity filters by improved diatom and turbidity removal. Also removal of colour from the final water, and increasing the useful life of the slow sand filters.

Plant Statistics
- Flow: 110 ml/d
- Preozone dose: 2 mg/l
- Ozone demand: 9.5 kg/h
- Number of generators: 2 rated at 9.5 kg/h each (maximum) (10-100%)
- Feed Gas: Oxygen
- Ozone concentration: 6 wt%
- Power Supply Unit: Medium frequency - 6 pulse
- Contact system: Preozonation, Radial diffusers
- Vent gas treatment: 2 off thermal vent ozone destructors with heat recuperation
- Control: Fully automatic plant, PLC controlled with Manual override.

Plants supplied to Yorkshire Water Services by Ozonia
- Loftsome Bridge and Headingley.

Client
Yorkshire Water Services Limited
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Halifax Road
Bradford BD6 2LZ
United Kingdom

Site
Loftsome Bridge WTW
Loftsome Bridge
Wressle, Selby YO8 7EN
United Kingdom

Contract
- Contract awarded: September 1992
- Contract take-over: December 1994

Ozonia Scope of Supply
- Ozone generation
- Ozone contacting
- Vent ozone destruction
- Cooling water system
- Piping, valves and instrumentation
- Electrics & controls
- Design, manufacture, supply, erection and commissioning
Ozonia products are available in all countries over the world. Please contact us to find out details of your representative.